

# OPERATOR'S MANUAL

# LM2350E-X

INCLUDING: SPECIFICATIONS, SERVICE KITS, GENERAL INFORMATION, PARTS, TROUBLESHOOTING  
INCLUDE MANUAL: S-633 GENERAL INFORMATION (PN 97999-625)

RELEASED: 3-7-97  
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(REV. F)

3" AIR MOTOR  
50:1 RATIO  
0 - 6250 PSI RANGE



## LM2350E-XX CHOP-CHECK GREASE PUMP



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,  
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

### SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- 637227 Pump Rebuild Kit.** Includes the necessary soft parts for normal service of the entire pump.

### SPECIFICATIONS

Model Series	LM2350E-XX
Type	Air Operated, Chop-Check Grease Pump
Ratio	50:1
Air Motor Diameter	3" (7.62 cm)
Stroke (Double Acting)	3" (7.62 cm)
Air Inlet	1/4" - 18 NPTF (f)
Material Outlet	LM2350E-X1 . 3/8" - 18 NPTF (f) LM2350E-X2 . Rc 3/8 (3/8" - 19 BSP Taper) (f)
Pump Construction	Carbon Steel
Dimensional Data	See Chart
Weight	See Chart

### PERFORMANCE

Air Inlet Pressure Range	0 - 150 PSI (0 - 10.3 bar)
Fluid Pressure Range	0 - 7500 PSI (0 - 517 bar)
Cycles / Minute Rec'd @ Working Flow	135
Displacement In <sup>3</sup> Per Cycle	0.875
Volume / Cycle	0.48 oz. (14.33 ml)
Cycles Per Lb.	30
Maximum Delivery / Min.	7.5 lbs (3.4 kg)
Noise Level @ 100 Psi	85 db(A)*
Accessories Available:	61113 Wall Mount Bracket 66073-1 Air Line Connection Kit

\* The pump sound pressure level has been updated to an Equivalent Continuous Sound Level (L<sub>Aeq</sub>) to meet the intent of ANSI S1. 13-1971, CAGI-PNEUROPS S5.1 using four microphone locations.

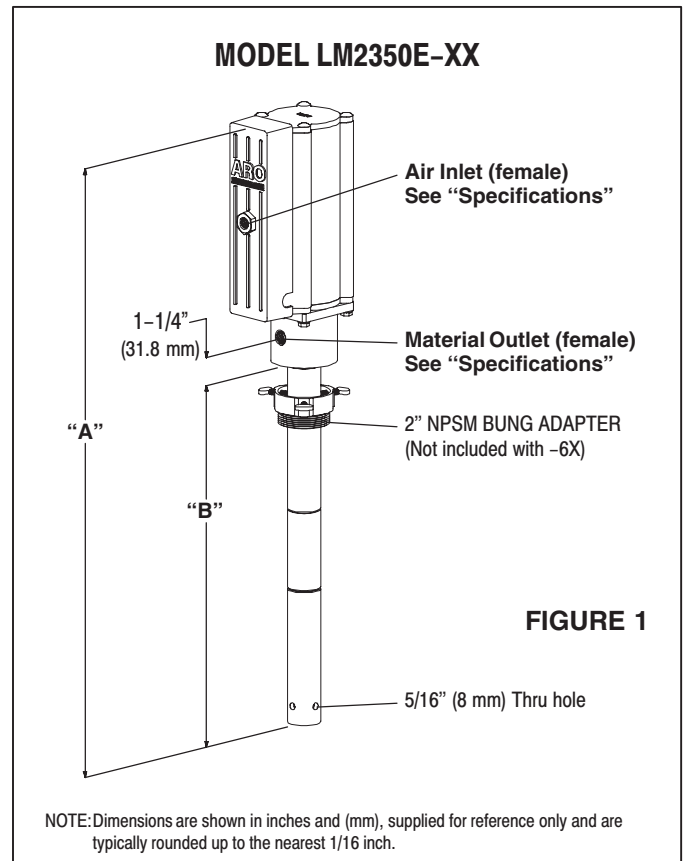
### GENERAL DESCRIPTION

Model LM2350E-X Series chop-check grease pump is intended to be used primarily for grease delivery systems. It uses carbon steel and other materials which make it compatible with most petroleum based lubrication products.

NOTE: If this pump was purchased separately (not part of a system), consult your sales representative for compatible dispensing accessories which will best match the application. All accessories must be able to withstand the maximum pressure developed by the pump.

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### PUMP DATA



MODEL	"A" (mm)	"B" (mm)	WEIGHT (kg)
LM2350E-2X	27-3/8 (695)	16-1/4 (412.8)	18.0 (8.16)
LM2350E-3X	40-1/8 (1019)	29 (736.6)	22.72 (10.31)
LM2350E-4X	48-5/8 (1235)	37-1/2 (952.5)	25.76 (11.68)
LM2350E-6X	30-1/8 (765)	19 (482)	19.0 (8.62)

### IMPORTANT

This is one of two documents which support the pump. Replacement copies of these forms are available upon request.

- LM2350E-X MODEL OPERATOR'S MANUAL
- S-633 GENERAL INFORMATION LUBRICATION PISTON PUMPS

**WARNING** READ THE GENERAL INFORMATION MANUAL INCLUDED FOR ADDITIONAL OPERATING AND SAFETY PRECAUTIONS AND OTHER IMPORTANT INFORMATION.



## PARTS LIST / LM2350E-XX

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]
1	Carriage Bolt (1/4" - 20 x 9" long)	(4)	94333	[C]
2	Upper Cap	(1)	94390	[Z]
✓3	Track Gasket	(2)	94392	[B]
4	Sleeve	(2)	94316	[Br]
✓5	"O" Ring (1/16" x 11/16" o.d.)	(4)	Y325-15	[B]
✓6	"O" Ring (1/8" x 3/4" o.d.)	(4)	Y325-206	[B]
7	Spool	(2)	94310	[D]
✓8	"U" Cup (1/8" x 3/4" o.d.)	(2)	Y240-7	[B]
✓9	"O" Ring (.106" x .587" o.d.)	(2)	15066	[B]
10	Cylinder	(1)	94306	[A]
11	Adapter	(1)	94384	[C]
✓13	"O" Ring (1/16" x 7/16" o.d.)	(1)	Y325-11	[B]
14	Muffler Housing	(1)	94443	[A]
15	Foam Liner	(2)	94402	
16	Edge Trim	(2)	94378-1	[N]
18	Retaining Ring	(1)	94406	[C]
19	Washer	(1)	94515	[C]
✓20	"U" Cup (3/16" x 3" o.d.)	(2)	94518	[B]
21	Piston	(1)	94403	[D]
22	Lower Cap	(1)	94391	[Z]
23	Piston Adapter	(1)	94388	[C]
✓24	"O" Ring (3/32" x 1" o.d.)	(1)	Y325-117	[B]
25	Dowel Pin (1/4" o.d. x 7/8" long)	(1)	Y148-37	[C]
✓26	"O" Ring (1/8" x 1-9/16" o.d.)	(1)	Y325-219	[B]
✓27	"O" Ring (3/32" x 11/16" o.d.)	(1)	Y325-112	[B]
28	Bushing	(1)	94374	[C]
✓29	Rod Seal	(1)	93921	[U]
30	Base - LM2350E-X1	(1)	94536	[C]
	- LM2350E-X2	(1)	94536-1	[C]
31	Nut (1/4" - 20)	(4)	93828	[SS]
32	Ground Screw (#10 - 32 x 1/4")	(1)	93005	[C]
✓33	Gasket	(1)	70834	[Co]
34	Extension Tube			
	- LM2350E-2X (7.531")	(1)	94401-2	[C]

ITEM	DESCRIPTION (Size In Inches)	QTY	PART NO.	[MTL]
	- LM2305E-3X (20.281")	(1)	94401-3	[C]
	- LM2305E-4X (28.781")	(1)	94401-4	[C]
	- LM2305E-6X (10.281")	(1)	94401-6	[C]
✓35	Gasket	(1)	70837	[Co]
36	Piston Rod	(1)	94385	[C]
37	Connecting Pin	(1)	90274	[C]
✓38	Cotter Pin (1/16" x 1/2" long)	(1)	Y15-21	[C]
39	Connector- LM2350E-2X (3.457")	(1)	94340-2	[C]
	- LM2350E-3X (16.207")	(1)	94340-3	[C]
	- LM2350E-4X (24.707")	(1)	94340-4	[C]
	- LM2350E-6X (6.207")	(1)	94340-6	[C]
	Piston & Tube Ass'y (includes 40 - 44)	(1)	71523	
40	Lower Suction Tube	(1)		[C]
41	Plunger	(1)		[C]
42	Ball Stop	(1)	83276	[C]
43	Ball (9/32" dia.)	(1)	Y16-209	[C]
44	Adapter	(1)	70817	[C]
✓45	Guide Washer	(1)	71524	[Co]
46	Spacer	(1)	72392	[C]
47	Retaining Ring (.763" o.d.)	(1)	Y147-68	[C]
48	"U" Cup (3/16" x 11/16" o.d.)	(1)	Y186-4	[B]
49	Guide Spacer	(1)	76705	[T]
50	Valve Body	(1)	76704	[SH]
✓	Foot Valve Ass'y (includes 47 - 50)	(1)	60940	
✓51	Gasket	(1)	F21-65	[Co]
52	Valve Seat	(1)	6797	[C]
53	Primer Rod	(1)	94446	[C]
✓54	Retainer Ring	(1)	94397	[C]
55	Primer	(1)	94400	[C]
56	Primer Tube	(1)	94399	[C]
* 57	Bung Assembly (includes 58)	(1)	67145-2	[ZA]
* 58	Thumb Screw (1/4" - 20 x 1")	(3)	Y66-59-C	[C]
*	Items 57,58 not with -6X models			
✓	Parts in Repair Kit		637227	

## OPERATING AND SAFETY PRECAUTIONS

**⚠ WARNING** EXCESSIVE INLET PRESSURE. Can cause explosion resulting in severe injury or death. Do not exceed maximum operating pressure of 7500 psi (517 bar) at 150 psi (10.3 bar) inlet air pressure. Do not run pump without using a regulator to limit air supply pressure to the pump.

**⚠ WARNING** EXCESSIVE MATERIAL PRESSURE. Can cause equipment failure resulting in severe injury or property damage. Do not exceed the maximum material pressure of any component in the system.

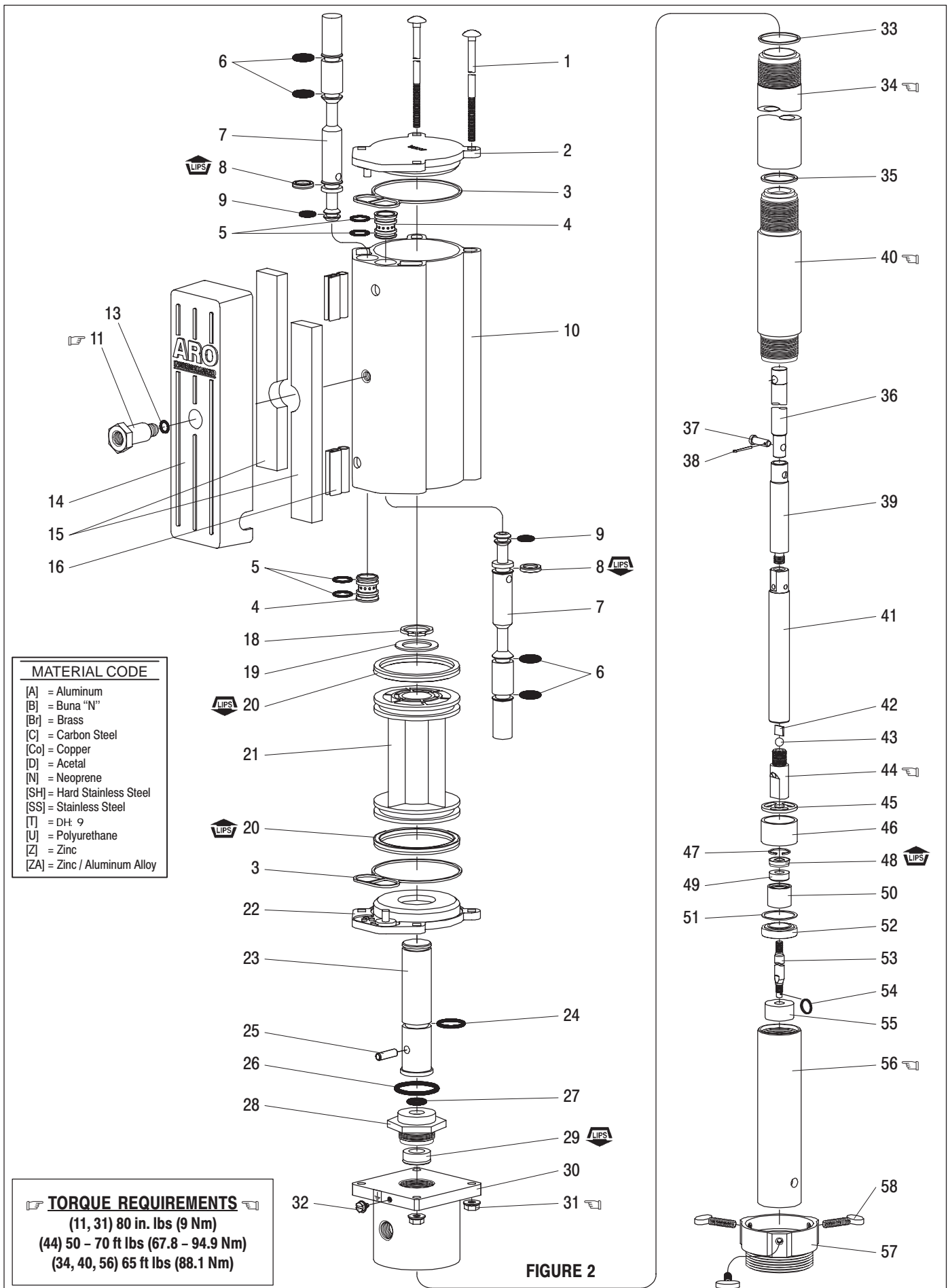
Replacement warning label is available upon request, PN \ 94520.

$$\text{PUMP RATIO} \times \text{INLET PRESSURE TO PUMP MOTOR} = \text{MAXIMUM PUMP FLUID PRESSURE}$$

Pump ratio is an expression of the relationship between the pump motor area and the lower pump end area. EXAMPLE: When 150 p.s.i. (10.3 bar) inlet pressure is supplied to the motor of a 50:1 ratio pump it will develop a maximum of 7500 p.s.i. (517 bar) fluid pressure (at no flow) - as the fluid control is opened, the flow rate will increase as the motor cycle rate increases to keep up with the demand.

NOTICE: Thermal expansion can occur when the fluid in the material lines is exposed to elevated temperatures. Example: Material lines located in a non-insulated roof area can warm due to sunlight. Install a pressure relief valve in the pumping system.

# PARTS LIST / LM2350E-XX



MATERIAL CODE	
[A]	= Aluminum
[B]	= Buna "N"
[Br]	= Brass
[C]	= Carbon Steel
[Co]	= Copper
[D]	= Acetal
[N]	= Neoprene
[SH]	= Hard Stainless Steel
[SS]	= Stainless Steel
[T]	= DH: 9
[U]	= Polyurethane
[Z]	= Zinc
[ZA]	= Zinc / Aluminum Alloy

**TORQUE REQUIREMENTS**

(11, 31) 80 in. lbs (9 Nm)  
 (44) 50 - 70 ft lbs (67.8 - 94.9 Nm)  
 (34, 40, 56) 65 ft lbs (88.1 Nm)

FIGURE 2

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## PUMP DISASSEMBLY

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**NOTE: All threads are right hand. Refer to Figure 2 (page 3). Disconnect air supply and relieve all system pressure prior to servicing.** Carefully remove the parts, inspect for damage, nicks or excessive wear and determine if any parts will need replacement.

1. Using a 7/8" wrench, unthread and remove (11) adapter and (13) "O" ring, releasing (14) muffler housing.
2. Using a 7/16" wrench, remove (31) nuts.
3. Remove four (1) bolts, (2) upper cap and (3) gasket.
4. Remove (10) cylinder, containing (4) sleeves and (7) spools.
5. Using (1) bolt, push (7) spools and (4) sleeves out "sleeve" end of (10) cylinder.
6. Remove (18) retaining ring, (19) washer and (21) piston.
7. Remove (25) dowel pin, releasing (23) piston adapter.
8. Remove (22) lower cap and (3) gasket.
9. Using a 1-3/4" wrench, unthread and remove (28) bushing, with (26 and 27) "O" rings.
10. Clamp (34) extension tube horizontally in a vise. Unthread and remove (30) base and (33) gasket. NOTE: Remove (29) rod seal only if replacement is necessary.
11. Pull up on (36) piston rod to reveal (38) cotter pin.
12. Remove (38) cotter pin and (37) connecting pin, releasing (36) piston rod.
13. Using (36) piston rod, push down on (39) connector until it bottoms.
14. Remove (54) retainer ring.
15. Push (55) primer up into (56) primer tube.
16. Lightly wedge a flat blade screwdriver between (55) primer and (56) primer tube, so (55) primer unthreads with (56) primer tube.
17. Insert a 5/16" diameter rod thru the cross holes in (56) primer tube and use the rod to unthread and remove (56) primer tube.
18. Remove (46) spacer, (51) gasket and (52) valve seat from (56) primer tube.
19. Remove (47 - 50) foot valve assembly from (53) primer rod.
20. Remove (47) retaining ring, releasing (48) "U" cup. NOTE: Do not remove (49) guide spacer unless replacement is necessary.
21. Remove (45) guide washer.
22. Clamp (40) lower suction tube horizontally in a vise. Unthread and remove (34) extension tube and (35) gasket.
23. Using a 7/32" diameter rod in the cross hole in (39) connector and a 9/16" wrench on the flats of (41) plunger, unthread and remove (39) connector from (41) plunger. NOTE: Do not damage the o.d. of (41) plunger in any way.
24. Using a 7/16" wrench on flats of (44) adapter and a 1/4" wrench on flats of (53) primer rod, unthread and remove (53) primer rod.
25. Clamp on flats of (41) plunger and, using a 1/4" wrench on flats of (44) adapter, unthread and remove (44) adapter, releasing (43) ball and (42) ball stop.

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## PUMP REASSEMBLY

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**NOTE: Thoroughly clean and lubricate all seals. Replace all soft parts with new ones included in the repair kit.** Note: Refer to the illustration (figure 2, page 3) for "U" cup lip seal direction.

1. Assemble (42) ball stop and (43) ball into (41) plunger, securing with (44) adapter. NOTE: Torque (44) adapter to 50 - 70 ft lbs (67.8 - 94.9 Nm).
2. Assemble (53) primer rod to (44) adapter, using wrenches on flats to tighten.
3. Thread (39) connector to (41) plunger, using a 7/32" diameter rod thru the cross hole to tighten.

4. Assemble (49) guide spacer and (48) "U" cup into (50) valve body, securing with (47) retaining ring. NOTE: Assemble chamfered corner of (49) guide spacer into (50) valve body first.
5. Assemble (45) guide washer and (47 - 50) foot valve assembly onto (53) primer rod.
6. Assemble (46) spacer, (51) gasket and (52) valve seat onto (53) primer rod.
7. Thread (55) primer onto (53) primer rod, securing with (54) retainer ring.
8. Thread (56) primer tube to (40) lower suction tube and tighten. NOTE: Torque (56) primer tube to 65 ft lbs (88.1 Nm).
9. Assemble (36) piston rod to (39) connector, securing with (37) connecting pin and (38) cotter pin.
10. Assemble (35) gasket and (34) extension tube to (40) lower suction tube and tighten. NOTE: Torque (34) extension tube to 65 ft lbs (88.1 Nm).
11. Assemble (33) gasket into (30) base and assemble (30) base to (34) extension tube. Clamp (30) base horizontally in a vise and tighten (34) extension tube. NOTE: Torque (34) extension tube to 65 ft lbs (88.1 Nm).
12. Assemble (29) rod seal over (36) piston rod and into (30) base.
13. Push up on (55) primer, exposing (36) piston rod.
14. Assemble (26 and 27) "O" rings to (28) bushing and thread (28) bushing into (30) base and tighten until it bottoms. NOTE: During assembly of (28) bushing, be careful not to damage (27) "O" ring.
15. Assemble (22) lower cap and (3) gasket to (30) base.
16. Assemble (24) "O" ring to (23) piston adapter and assemble (23) piston adapter to (36) piston rod, securing with (25) dowel pin.
17. Replace (20) "U" cups on (21) piston and assemble (21) piston onto (23) piston adapter, securing with (19) washer and (18) retaining ring.
18. Replace (5) "O" rings on (4) sleeves and assemble (4) sleeves into (10) cylinder. NOTE: Assemble each sleeve into the end of the cylinder nearest the exhaust hole.
19. Replace (6 and 9) "O" rings and (8) "U" cups on (7) spools and assemble (7) spools into (10) cylinder from the opposite end as the (4) sleeve went in.
20. Assemble (10) cylinder onto the pump, being careful when sliding over the lips of (20) "U" cups. NOTE: Be sure (3) gasket is seated properly.
21. Replace (3) gasket on (2) upper cap and assemble (2) upper cap to (10) cylinder.
22. Assemble (1) bolts to pump, securing with (31) nuts. NOTE: Torque (31) nuts to 80 in. lbs (9 Nm).
23. Replace (13) "O" ring on (11) adapter.
24. Assemble (15) foam liners and (16) edge trims to (14) muffler housing.
25. Assemble (14) muffler housing to (10) cylinder, securing with (11) adapter. NOTE: Torque (11) adapter to 80 in. lbs (9 Nm).

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## TROUBLE SHOOTING

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**If the pump will not cycle or will not deliver material.**

- Be certain to check for non-pump problems including kinked, restrictive or plugged inlet/outlet hose or dispensing device. Depressurize the pump system and clean out any obstructions in the inlet/outlet material lines.
- Check all seals, including track gaskets.
- Check direction of "U" cup lips.